

CLAIMS

1. A piston crown for a piston of a large-bore internal combustion engine, comprising:

a piston crown, said piston crown having a centerline and a diameter of at least 180 millimeters;

5 a crown bowl formed in said piston crown, said crown bowl having a bowl sidewall, said bowl sidewall defining, with respect to the centerline, a maximum bowl radius and a minimum bowl radius; and
a piston squish face circumscribing said crown bowl;
wherein said bowl sidewall has an acute re-entrant angle relative
10 to said piston squish face, wherein said maximum bowl radius exceeds said bowl edge radius, and wherein said maximum bowl radius is disposed further from said squish face than said minimum bowl radius is disposed from said squish face.

2. The piston crown of Claim 1, wherein a lower curve radius defines a lower curve of said crown bowl, wherein an upper curve radius defines an upper curve of said crown bowl, and wherein a sidewall tangent is formed by an intersection of the upper and lower curve radii, wherein the
5 sidewall tangent defines an orientation of said bowl sidewall; and wherein said re-entrant angle is defined by an intersection of the sidewall tangent with respect to a plane parallel to said squish face, wherein said re-entrant angle is measured clockwise from the plane.

3. A large-bore diesel engine, comprising:

a cylinder defined by a cylinder liner having a liner wall; and

a piston having a centerline and a diameter of at least 180 millimeters, said piston being reciprocable within said cylinder liner, said
5 piston having a piston crown comprising:

a crown bowl having a bowl sidewall, said bowl sidewall defining, with respect to the centerline, a maximum bowl radius and a minimum bowl radius; and

a piston squish face circumscribing said crown bowl;

10 wherein said bowl sidewall has an acute re-entrant angle relative to said piston squish face, wherein said maximum bowl radius exceeds said minimum bowl radius, and wherein said maximum bowl radius is disposed further from said squish face than said minimum bowl radius is disposed from said squish face.

4. The engine of Claim 3, wherein a lower curve radius defines a lower curve of said crown bowl, wherein an upper curve radius defines an upper curve of said crown bowl, and wherein a sidewall tangent is formed by an intersection of the upper and lower curve radii, wherein the sidewall
5 tangent defines an orientation of said bowl sidewall; and wherein said re-entrant angle is defined by an intersection of the sidewall tangent with respect to a plane parallel to said squish face, wherein said re-entrant angle is measured clockwise from the plane.

5. The engine of Claim 3, further comprising an anti-polish ring positioned at an upper portion of said liner wall adjacent said piston crown when said piston is at a top dead center position in said cylinder.

6. The engine of Claim 5, wherein said piston has a piston ring package, and wherein said anti-polishing ring has a predetermined height such that said piston ring package does not come into contact with said anti-polishing ring during the reciprocation of said piston; and wherein said anti-
5 polish ring projects a selected distance into said cylinder, and wherein a portion of said piston adjacent said piston crown is recessed a distance substantially equal to said selected distance.

7. The engine of Claim 6, wherein said liner wall has an annular slot formed therein; and wherein said anti-polish ring is received by said slot.

8. The engine of Claim 7, wherein a lower curve radius defines a lower curve of said crown bowl, wherein an upper curve radius defines an upper curve of said crown bowl, and wherein a sidewall tangent is formed by an intersection of the upper and lower curve radii, wherein the sidewall tangent defines an orientation of said bowl sidewall; and wherein said re-entrant angle is defined by an intersection of the sidewall tangent with respect to a plane parallel to said squish face, wherein said re-entrant angle is measured clockwise from the plane.

9. The engine of Claim 6, wherein said liner wall and said anti-polish ring are integrally formed as a single piece.

10. The engine of Claim 9, wherein a lower curve radius defines a lower curve of said crown bowl, wherein an upper curve radius defines an upper curve of said crown bowl, and wherein a sidewall tangent is formed by an intersection of the upper and lower curve radii, wherein the sidewall tangent defines an orientation of said bowl sidewall; and wherein said re-entrant angle is defined by an intersection of the sidewall tangent with respect to a plane parallel to said squish face, wherein said re-entrant angle is measured clockwise from the plane.

11. An internal combustion engine, comprising:
a cylinder defined by a cylinder liner having a liner wall;
a piston reciprocable within said cylinder; and
an anti-polish ring positioned at an upper portion of said liner
5 wall adjacent said piston when said piston is at a top dead center position in
said cylinder;
wherein said liner wall and said anti-polish ring are integrally
formed as a single piece.

12. The engine of Claim 11, wherein said piston has a piston
ring package, and wherein said anti-polishing ring has a predetermined
height such that said piston ring package does not come into contact with
said anti-polishing ring during the reciprocation of said piston; and wherein
5 said anti-polish ring projects a selected distance into said cylinder, and
wherein a portion of said piston adjacent said piston crown is recessed a
distance substantially equal to said selected distance.